

THE GENUS *SENECIO* IN NEW ENGLAND.

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AMONG the flowering plants there are few genera more widely distributed throughout North America than is the genus *Senecio*. In New England the indigenous species with but one exception (*S. Pseudo-Arnica*, Less.) all belong to the same natural group, and exhibit very close affinity.

The first species of this genus to be described from North America were *S. aureus* L., *S. Balsamitae*, and *S. obovatus*, Muhl. These were followed by the publication of other Atlantic species by Michaux, Pursh and other prominent botanists. Nearly all of these early described species, however, were later regarded either as identical with *S. aureus*, L., or as varieties or forms of the same. By more recent authors certain of these earlier species have been reinstated, and seemingly very justly so.

After a somewhat extended study of a representative collection of plants from different parts of North America, aided by a comparison with the originals in the older herbaria, the writer has been led to the adoption of a somewhat intermediate course in the disposition of the species of this particular group, as well as in the treatment of the North American species as a whole. It is hoped that the complete results may be brought forward at an early date; but it is thought that a synopsis of all the forms which are at present known to occur in New England may be of sufficient interest to merit publication.

The synopsis herewith presented is based entirely upon the macroscopic or more evident characters; and while now and then puzzling forms occur, yet in the main the specific limitations are tolerably constant. It should, however, be borne in mind that in any group of plants where the foliage is subject to such variation as in this particular group of *Senecios*, as complete specimens as possible should be obtained for satisfactory identification. The following are the species and varieties as now recognized for New England:

* Indigenous species: heads conspicuously radiate.

+ Heads large, 2 cm. or more high: stems leafy throughout.

1. *PSEUDO-ARNICA*, Less. Stems 1 to 6 dm. high, more or less

floccosely white-tomentose especially above: leaves oblong-lingulate, 5 to 20 cm. long, 1 to 6 cm. broad, sessile, half-clasping by a subauriculate base, or the lowermost narrowed below into a winged petiolar base, obtuse or rounded at the apex, entire or unequally dentate, usually green and glabrous above, densely white-tomentose beneath: heads large, including the rays 3 to 6 cm. in diameter: involucre calyculate with linear-attenuate or subsetaceous bracteoles: achenes glabrous.—Linnaea, vi. 240; Hook. Fl. Bor.-Am. i. 334, t. 113; Gray, Syn. Fl. i. part 2, 384; Britton & Brown, Ill. Fl. iii. 476, f. 4033; Watson & Coulter in Gray, Manual, ed. 6, 294.—Coast of New Brunswick, Grand Manan, *A. E. Verrill*, no. 3. Reported from the adjacent coast of MAINE.

+ + Heads medium-sized, about 1 cm. or less high: stems not leafy throughout.

++ Lower leaves all broad-ovate, cordate, rather large.

2. *S. AUREUS*, L. Stems erect from rather slender rootstocks, 3 to 6 dm. high, and at first as well as the foliage often more or less floccose-tomentose, later, except for a trace of tomentum in the axils of the leaves and in the inflorescence, essentially glabrous: lower leaves long-petioled, ovate-rotund to slightly ovate-oblong, 1.5 to 8 cm. long, two thirds as broad, crenate-dentate; cauline leaves lyrate to laciniate-pinnatifid, the uppermost sessile and amplexicaul: achenes glabrous.—Sp. ii. 870, & ed. 2, 1220; Gray, Syn. Fl. i. part 2, 391; Watson & Coulter, l. c. 293; Britton & Brown, Ill. Fl. iii, 480, f. 4047.—MAINE, valley of Limestone River, *Fernald* no. 2403; Blaine, *Fernald*, no. 2404; Easton, *Fernald* (coll. of 29 June, 1899); North and South Berwick, *Parlin & Fernald*; South Berwick, *Parlin*; Fayette and Presque Isle, *Miss Kate Furbish*: NEW HAMPSHIRE, Jaffrey, *Robinson*, no. 590; Greenville, *Fernald* (coll. of 6 June, 1897): VERMONT, Manchester, *Miss Mary A. Day*, no. 102: MASSACHUSETTS, vicinity of Boston, *Wm. Boott*, etc.: RHODE ISLAND, *Thurber*; near Providence, *Collins* (coll. of 24 May, 1891): CONNECTICUT, Southington, *Bissell* no. 343.

++ ++ Lower leaves chiefly long-lanceolate from a subcordate to an abruptly contracted base, only the earliest ovate-rotund, and these small.

3. *S. ROBBINSII*, Oakes. Stems strict, 5 to 7 dm. high, striate, glabrous above, slightly tomentose at the base: the first leaves small, ovate-rotund to ovate-oblong, 1 to 3 cm. long, from two thirds to nearly as broad, crenate-dentate; the later fully developed radical and lower-stem leaves long petiolate, lanceolate to slightly oblong-lanceolate, 3 to 10 cm. long, 1.5 to 3 cm. broad, acute, rather sharply and somewhat unequally dentate-serrate, glabrous upon either surface,

slightly tomentose along the margins of the sheathing petioles; the uppermost sublyrate to more or less laciniately pinnatifid, sessile and somewhat clasping: inflorescence cymose-corymbose: achenes glabrous. — Oakes ex Rusby in Bull. Torr. Club, xx. 19, t. 139; Britton & Brown, Ill. Fl. iii. 480, f. 4046. *S. aureus*, var. *Robbinsii*, Gray ex Rusby, l. c., *S. aureus*, var. *lanceolatus*, Oakes, Hovey's Mag. vii. 183; Torr. and Gray, Fl. ii, 442; Gray, Manual, 240; not *S. lanceolatus*, Torr. & Gray, l. c., 440. *S. aureus*, var. *Balsamitae*, Watson and Coulter, l. c. in part. — MAINE, region about Moosehead Lake, *Fernald*, no. 272; along St. John River, *Fernald* (coll. of 24 July, 1893); valley of Mattawamkeag River, *Fernald*, no. 2649; valley of Sandy River, *Fernald* (coll. of 9 July, 1896); Hartford, *Parlin* (coll. of July 1892); Orono, *Fernald* (coll. of 30 June, 1893); East Livermore, *Miss Kate Furbish* (coll. of June, 1888); Farmington, *C. H. Knowlton* (coll. of 21 June, 1893); NEW HAMPSHIRE, Jackson, *H. A. Purdie* (coll. of 10 September, 1896); White Mountains, Crawford Notch, *E. & C. E. Faxon* (coll. of 7 July, 1878), *Greenman*, no. 1105: VERMONT, Willoughby Lake, *Walter Deane* (coll. of 26 July, 1885); Middlebury, *Brainerd* (coll. of 23 and 25 June, 1883).

++ ++ ++ Lower leaves obovate to oblong-ob lanceolate or subspatulate and gradually narrowed at the base (rarely rotund or oblong).

= Lower leaves obovate, or obovate-rotund.

4. *S. OBOVATUS*, Muhl. Stems erect, 3 to 6 dm. high, slightly tomentose at the base and in the axils of the leaves, soon glabrate: lower leaves obovate, 1 to 10 cm. long, two thirds as broad, usually cuneate at the base into a narrowly winged petiole, rarely rotund, glabrous upon either surface, margins crenate-dentate; stem-leaves sessile, pinnatifid or pinnatisect: inflorescence cymose-corymbose, not infrequently subumbellate: achenes glabrous.—Muhl. ex Willd. Sp. Pl. iii, 1999; DC. Prodr. vi. 432; Ell. Sketch, ii, 329; Britton & Brown, Ill. Fl. iii. 478, f. 4041. *S. aureus*, var. *obovatus*, Torr. & Gray, Fl. ii. 442; Gray, Syn. Fl. i. part 2, 391. — VERMONT, Pownal, *Eggleston*, no. 264: MASSACHUSETTS, Boxford, *Faxon* (coll. of 22 June, 1878): CONNECTICUT, Southington, *Bissell*, no. 344. This species reaches its greatest development and variation in the Southern States.

= = Lower leaves oblong-ob lanceolate to subspatulate, gradually narrowed at the base.

a. Achenes usually glabrous; lower leaves comparatively short-petiolate.

5. *S. BALSAMITAE*, Muhl. Stems 1.5 to 3 dm. high, floccose-tomentose at the base, glabrous or nearly so above, often retaining loose tomentum in the leaf-axils: lower leaves commonly oblong-ob lanceolate, 1 to 4 cm. long, 0.5 to 1.5 cm. broad, gradually narrowed below

into the petiole, crenate-dentate, frequently pubescent beneath when young, later glabrate, or glabrous from the beginning; stem-leaves more or less lyrate-pinnatifid, the uppermost sessile and much reduced: heads 1 cm. or less high: achenes usually glabrous.—Muhl. ex Willd. Sp. Pl. iii. 1998; DC. Prodr. vi. 432; Britton & Brown, Ill. Fl. iii. 479, f. 4043. *S. aureus*, var. *Balsamitae*, Torr. & Gray, Fl. ii. 442; Gray, Syn. Fl. i. part 2, 391, in part; Watson & Coulter in Gray, Man. ed. 6, 293, mainly. — MAINE, mouth of Aroostook River, Ft. Fairfield, *Fernald*, no. 71; Orono, *Fernald* (coll. of 1 July, 1890); valley of Piscataquis River, Dover, *Fernald*, no. 118; valley of the St. John River, Fort Kent, *Fernald*, no. 2406: VERMONT, Colchester, *Oakes*: MASSACHUSETTS, *Oakes*.

var. **pauperculus** (Michx.) Fernald in herb. Smaller, sometimes barely more than 3 cm. high: heads fewer, not infrequently reduced to one: plant with generally reduced habit and of northern range. — *S. pauperculus*, Michx. Fl. ii. 120. — MAINE, Pamedumcook Lake, *J. W. Chickering* (coll. of 10 August, 1881); Lower Penobscot Valley, Old Town, *Fernald* (coll. of 18 September, 1897).

b. Achenes hirtellous-pubescent: lower leaves long-petiolate.

var. **praelongus**. Stems 2 to 5.5 dm. high, usually conspicuously floccose-woolly at the base: lower leaves long petiolate, oblong-ob lanceolate, 1.5 to 6 cm. long, 10 to 12 mm. broad: stem-leaves rather large, even to 1 dm. in length, and 2 cm. in breadth, pinnatifid with rather remote lobes and rounded sinuses; achenes hirtellous-pubescent upon the angles. — MASSACHUSETTS, in rocky woods near the summit of Blue Hill, 9 June, 1895, *Wm. P. Rich*: VERMONT, Manchester, *Miss Mary A. Day*, no. 210: NEW YORK, Watertown, *specimen ex herb. Wm. Boott*.

This variety has hitherto passed as *S. aureus*, var. *Balsamitae*, of authors, but it is a somewhat stouter plant with longer petiolate lower leaves, and with more pronounced stem-leaves than in typical specimens of the species proper. It is somewhat intermediate between the northern *S. Balsamitae*, Muhl, and the southern *S. Smallii*, Britton.

* * Introduced species: heads inconspicuously radiate, or rayless.

+ Pubescence viscid-glandular.

6. *S. viscosus*, L. A strong-scented annual, viscid-pubescent throughout, 2 to 4 dm. high, usually branched from the base: leaves half-clasping, 3 to 6 cm. long, two-thirds as broad, once or twice pinnatifid with rounded sinuses and angulate-sinuate lobes: head radiate; rays minute: achenes glabrous. — Sp. ii. 868, & ed. 2, 1217;

Engl. Bot. t. 32; Fl. Dan. t. 1230; Gray, Syn. Fl. i. part 2, 394; Britton & Brown, Ill. Fl. iii. 483, f. 4054 — MAINE, Mt. Desert Island, *Rand*, and adjacent coast: MASSACHUSETTS, vicinity of Boston, *Wm. Boott* (coll. of Sept., 1879); CAMBRIDGE, *B. L. Robinson* (coll. of 1 Sept., 1897): RHODE ISLAND, near Providence, *J. W. Congdon* (coll. of 4 Sept., 1874); *W. W. Bailey* (coll. of 1876).

+ + Pubescence not glandular.

++ Heads usually with short inconspicuous rays: involucre barely calyculate.

7. *S. SYLVATICUS*, L. Stems erect, 1 to 4 dm. high, simple or branched, usually somewhat pubescent: lower leaves petioled and more or less lyrate, the upper pinnatifid with unequal lobes, sessile, clasping and slightly sagittate, 2 to 15 cm. long, 1 to 8 cm. broad: inflorescence naked or nearly so: heads cylindrical; involucre barely calyculate with few and inconspicuous scales: ligules barely surpassing the disk-flowers (or none?): achenes canescent. — Sp. ii. 868, & ed. 2, 1217; Eng. Bot. t. 748; Fl. Dan. t. 869; Gray, Syn. Fl. i. part 2, 394; Britton & Brown, Ill. Fl. iii. 482, as to description. — MAINE, Mt. Desert Island and Southport, *Fernald*.

++ ++ Heads rayless: involucre conspicuously calyculate with short black-tipped scales.

8. *S. VULGARIS*, L. Stems 1 to 4 dm. high, essentially glabrous, or subfloccose-pubescent especially in the axils of the leaves and in the inflorescence: leaves pinnatifid, more or less lyrate, with angulately toothed divisions, sessile and subclasping, 2 to 8 cm. long: heads discoid: achenes puberulent along the angles. — Sp. ii. 867, & ed. 2, 1216; Fl. Dan. t. 513; Eng. Bot. t. 747; Gray, Syn. Fl. i. part 2, 394; Britton & Brown, Ill. Fl. iii. 482, f. 4053. — MAINE, Blaine, *Fernald* (coll. of 12 Sept., 1896): VERMONT, Rutland, *Eggleston*: MASSACHUSETTS, Ipswich, *Oakes*; Swampscott, *C. A. Weatherby* (coll. of 21 June, 1897); Revere Beach, *Greenman*, no. 515, RHODE ISLAND, Providence, *Thurber* (coll. of 1844): CONNECTICUT: Southington, *Andrews* no. 1.

BERLIN, GERMANY.

FOSSOMBRONIA SALINA IN CONNECTICUT.

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THE various species of *Fossombronia* resemble one another so closely in their vegetative characters, that it is, in most cases, a questionable policy to describe new species from specimens whose capsules